A GUIDE
A GUIDE TO
A GUIDE TO THE MINOLTA SLR SYSTEM
THE MINOLTA SLR SYSTEM
O THE MINOLTA SLR SYSTEM
MINOLTA SLR SYSTEM OF CREATIVE PHOTOGRAPHY
A SLR SYSTEM OF CREATIVE PHOTOGRAPHY
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The Minolta SLR System of Creative Photography

Minolta makes a really complete 35mm photographic system so that you can be a really complete photographer. Now that you own one of the famous Minolta SLR cameras, you have the nucleus of the world's finest system of 35mm photography. Your potential is practically unlimited.

Judged by any standards of photographic excellence, Minolta SLR cameras are thoroughly professional instruments of uncompromising quality. With their versatile complement of Minolta lenses and precision Minolta and Leitz accessories, they are capable of mastering virtually any photographic situation imaginable.

Minolta makes more than 150 lenses, accessories, and attachments for use with Minolta SLR cameras. Encompassed are interchangeable Minolta lenses, including-meter-coupled zoom-type, from 7.5mm fisheye to 1600mm extreme telephoto plus the full range of accessories and attachments shown on the facing page. Most of these are described in this booklet.

Now that you own a Minolta SLR camera, you owe it to yourself to fit it with genuine Minolta and adapted Leitz accessories and particularly with Minolta interchangeable lenses that match it in quality. Minolta lenses are made expressly for your SLR and accessories are specially adapted by Minolta for it. To assure best results, be sure you get these genuine products; they are the only ones that will give you maximum performance every time.

The object of the Minolta SLR system is to give every photographer, no matter what his skill, a creative choice in all areas of photography. Your Minolta dealer can demonstrate the full SLR camera, lens, and accessory line and help you choose the equipment that best suits your needs. See him for technical help, too. Your adventures in creative photography may very well begin in his store.

How Minolta Makes a Lens

Minolta is one of only three camera companies in Japan and one of a very few in the world that make their own optical glass and lenses. This little-known fact becomes very important when you consider that only in this way can a camera company ensure the precise optical and mechanical design properties so vital to advanced photography.

Before a Minolta lens is mounted on a Minolta camera, it passes through a complex series of manufacturing steps performed to the highest standards in the camera industry. Each Minolta lens, in fact, is the end result of a long series of computations and tests aimed at eliminating the various aberrations that interfere with theoretically perfect lens performance. What kinds of glass should be used? What should the curvature and diameter of lens elements be? How should they be positioned? Minolta lens designers, aided by Minolta's own electronic computer, investigate and decide on these and many other problems long before the actual making of a lens.

The Basic Ingredients

The "recipe" of glass-making ingredients varies with the type of glass to be made. Among the materials often used are silica, sodium carbonate, alumina, barium, and lead oxide. Among many other ingredients that may be added to

obtain special characteristics for quality Minolta lenses are thorium, zirconium, and rare-earth elements such as lanthanum.

The measured materials are melted and stirred in crucibles (platinum-lined ones for high-index glasses) at temperatures in the neighborhood of 1500°C for many hours, then gradually cooled over a period of days. The congealed glass is broken into easily-handled fragments which are subjected to rigid inspections for bubbles, striae, and other defects, and imperfect pieces or parts are discarded. The perfect lumps are split into weight-sized pieces, which are tumbled, heat-softened, and hydraulically pressed into blanks. From one to two further weeks of fine annealing processing relieves internal stresses and adjusts refractive index.

Grinding, Polishing, and Achromatic Coating

Diamond grinders are used for initial shaping of the disk-shaped lens blanks, which are then further rough-ground with abrasive to approximate curvature. The rough-ground lens ele-

ments then pass through a series of mechanized abrasive and rough polishers with continual curvature gauging to produce the final high-precision finish. Optical centering and assembly in special dust- and temperature-controlled facilities precede final rigid adjustment and testing.

Not satisfied with conventional magnesium-fluoride single-layer lens coating, Minolta nearly 20 years ago pioneered in originating special "Achromatic Coating" with a double layer having special ingredients for higher light transmission and improved color with Minolta lenses. This exclusive process has been continually developed since then incorporating the many technological strides made in the field. It now involves up to several layers per surface of the most advanced ingredients deposited by latest techniques in the exact combination and microscopic thicknesses to achieve the effect required. As a result, Minolta lenses give less flare, better image contrast, and rich, true colors—better than any other lenses on the market we are sure you'll agree.

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Focal Length, Lens "Speed," and Angle of View

The focal length of a lens is the distance from a calculated point on the lens axis (usually at or near the lens diaphragm for medium focal lengths) to the film plane when the lens is focused at infinity.

Dividing the focal length by the diameter of the diaphragm aperture yields the f-number at the lens opening. At any constant focal length,

the f-number thus becomes smaller as the aperture diameter becomes larger, but the volume of light passed by the lens increases. At usual apertures, each f-number setting in the series allows transmission of twice the light volume of the next numerically smaller one and half that of the next numerically larger one. For example, when you change the lens setting from f/5.6 to f/4, light passing through the lens is doubled. Changing the setting from f/5.6 to f/8, on the other hand, cuts light transmitted in half. One such doubling or halving is one full f-stop.

The "speed" of a lens is indicated by its maximum aperture: The larger this lens opening (i.e., the smaller the f-number), the "faster" the lens. An f/1.4 lens is considered one stop faster than, or twice as fast as, an f/2.

Angle of view is a measurement in degrees of the amount of a scene included across the diagonal of the frame covered by the lens at a given distance. As focal length decreases, angle of view generally increases: Thus, a 50mm standard lens has an angle of view approximately double that of a 100mm telephoto.

Cleaning and Storage of Lenses

If a lens becomes dusty of soiled, loose matter may be whisked off with a bellows lens brush and the glass surface wiped gently with a soft, clean cloth.

Lenses should be stored away from heat, high humidity, and harmful chemicals and vapors. Always keep lenses capped in their cases when they are not in use.

When attaching or removing a lens from the camera body, be careful not to touch the glass surfaces.

Minolta Wideangle Lenses

These lenses have a number of interesting and useful applications for both amateur and professional photographers. With their ability to take in a large part of a scene at short distances, they are especially useful when working at close quarters. Their exaggerated perspective suits them to use for special effects and in creative photography. Both these characteristics of wideangle lenses are employed to advantage in architectural photography.

The short focal length of wideangle lenses gives them considerable depth of field even at large apertures or short distances. This inherent extra depth of field can aid in making sharp photos at peak action without the delay needed for adjusting focus.

Naturally, each of these Minolta wideangles is a meter-coupled, auto-diaphragm lens designed to permit full-aperture metering/viewing and operation as normal with no need for mirror lock-up.

Minolta 7.5mm f/4 MD Fisheye

Construction: 12 elements in 8 groups
Angle of view; 180°
Focusing: Fixed at 1.2m (4 ft.)
covering 0.5m (1.6 ft.) to infinity at full aperture
Filters: Built-in
Diaphragm: Auto preset f/4—f/22

Minolta 16mm f/2.8 MD Fisheye

Construction: 11 elements in 8 groups
Angle of view: 180°
Min. focus distance: 0.3m (1 ft.)
Filters: Built-in
Diaphragm: Auto preset f/2.8—f/22

10 **Minolta 17mm f/4 MD**

Construction: 11 elements in 9 groups
Angle of view: 104°
Min. focus distance: 0.25m (0.8 ft.)
Filter thread diameter: 72mm
Diaphragm: Auto preset f/4—f/22

Minolta 20mm f/2.8 MD

Construction: 10 elements in 9 groups
Angle of view: 94°
Min. focus distance: 0.25m (0.8 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/2.8—f/22

Minolta 24mm f/2.8 MD

Construction: 9 elements in 7 groups
Angle of view: 84°
Min. focus distance: 0.3m (1 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/2.8—f/22

12 **Minolta 24mm f/2.8 MD VFC**

Construction: 9 elements in 7 groups
Angle of view: 84°
Min. focus distance: 0.3m (1 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/2.8—f/22

This is the world's first lens whose field of sharp focus can be varied continuously at will from concave through flat to convex by simply moving a control ring on the barrel. Thus, even if distances from center and edges of objects to the film plane are too different to be covered by depth of field (particularly at close range and/or large apertures), sharp photos having excellent image quality can be obtained of many subjects by appropriately curving the field. On the other hand, this capability can also be used creatively to deliberately render parts of the subject out of focus, or the lens can be used as a conventional flat-field widenagle. Either way, optimum image quality is assured by the "floating" focusing system and Minolta Achromatic coating incorporating latest techniques.

Photo on right was taken with the Minolta VFC Lenses field curved in the "wrong" direction, above photo at the same focus and aperture setting shows the result of curving it to conform to the subject.

Minolta 28mm f/3.5 MD

Construction: 5 elements in 5 groups
Angle of view: 75°
Min. focus distance: 0.3m (1 ft.)
Filter thread diameter: 49mm
Diaphragm: Auto preset f/3.5—f/22

Minolta 28mm f/2.8 MD

Construction: 7 elements in 7 groups
Angle of view: 75°
Min. focus distance: 0.3m (1 ft.)
Filter thread diameter: 49mm
Diaphragm: Auto preset f/2.8—f/22

Minolta 28mm f/2 MD

Construction: 10 elements in 9 groups
Angle of view: 75°
Min. focus distance: 0.3m (1 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/2—f/22

16

Minolta 35mm f/2.8 MD

Construction: 5 elements in 5 groups
Angle of view: 63°
Min. focus distance: 0.3m (1 ft.)
Filter thread diameter: 49mm
Diaphragm: Auto preset f/2.8—f/22

Minolta 35mm f/1.8 MD

Construction: 8 elements in 6 groups
Angle of view: 63°
Min. focus distance: 0.3m (1 ft.)
Filter thread diameter: 49mm
Diaphragm: Auto preset f/1.8—f/22

18 **Minolta 35mm f/2.8 Shift CA**

Construction: 9 elements in 7 groups
Angle of view: 63°
Min. focus distance: 0.3m (1 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/2.8—f/22

Minolta's exclusive mechanism for this lens makes full-circle shift very easy without rotating the barrel. Adjustment is conveniently made visually through the finder without watching scales, since movement stops at the range limit in any direction. Vertical shift enables taking in more of a subject without tilting the camera (see right). Lateral or diagonal shift is effective in avoiding intruding foreground elements (e.g., bushes, utility poles) or undesirable reflections (as on paintings, mirrors) without moving the camera, or to make panoramic exposures to be joined later. But further, this lens incorporates Minolta's exclusive variable-field-curvature control (p. 12) for broadened versatility. Shift and VFC functions can also be used together in a wide variety of combinations for unique curve-tilt effects not possible with any other lens. This is the first of its type to have auto-diaphragm operation, for viewing and focusing at full-aperture brightness.

Tilting ordinary lens up or down to include more of object results in converging subject lines in picture (right); besides rising to correct this (above), 35mm Shift CA lens features exclusive shift mechanism, VFC control, and auto diaphragm for unique versatility and advantages.

Minolta Standard Lenses

The Minolta MD 45mm f/2 and 50mm f/1.7, f/1.4 and f/1.2 lenses are widely known as the fine "normal" or "standard" lenses for Minolta SLR cameras and are well suited for most general photographic purposes.

All are ideal for available-light photography indoors and for other low-illumination situations.

Light in weight and styled with "human-engineered" waffle-pattern rubber focusing grips, these standard lenses are fitted with automatic iris diaphragms and meter-coupling lug rings. They thus provide for full-aperture light metering or focusing with the diaphragm always open to maximum aperture except at the instant of exposure.

Minolta 45mm f/2 MD

Construction: 6 elements in 5 groups
Angle of view: 51°
Min. focus distance: 0.6m (2 ft.)
Filter thread diameter: 49mm
Diaphragm: Auto preset f/2—f/16

Minolta 50mm f/1.7 MD

Construction: 6 elements in 5 groups
Angle of view: 47°
Min. focus distance: 0.45m (1.5 ft.)
Filter thread diameter: 49mm
Diaphragm: Auto preset f/1.7—f/16

Minolta 50mm f/1.4 MD

Construction: 7 elements in 6 groups
Angle of view: 47°
Min. focus distance: 0.45m (1.5 ft.)
Filter thread diameter: 49mm
Diaphragm: Auto preset f/1.4—f/16

22 **Minolta 50mm f/1.2 MD**

Construction: 7 elements in 6 groups
Angle of view: 47°
Min. focus distance: 0.45m (1.5 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/1.2—f/16

Minolta Telephoto and Zoom Lenses

The Minolta telephoto and zoom lenses are available in a wide range of fixed or continuously variable focal lengths that starts with 24mm and extends through 1600mm. Like the wideangle and standard Minolta lenses, all are fully meter- and auto-diaphragm-coupled for full-aperture metering/viewing, except for the RF lenses, with which the stop-down method is used.

The 85mm, 100mm, and 135mm Tele Minolta lenses have long been popular among working professionals. All are ideal for candid or portrait photography, allowing greater working distances from subjects and preventing distortion of features (nose, ears, chin) nearest the lens.

The Minolta 200mm and 300mm telephotos offer even more optical "reach" for the sports, nature, or human-interest photographer yet are

lightweight and compact enough to be hand-held. They are invaluable for photographing unapproachable subjects such as distant landmarks or to keep you a safe distance from dangerous objects and situations. The Minolta 400mm f/5.6 Apo lens incorporates a fluorite element for eliminating the undesirable "secondary spectrum" that degrades images. It is ideal for long-lens work requiring particularly sharp definition, and attached with the optional 2X Converter it becomes a top-quality 800mm meter-coupled super tele.

Each of the Minolta Zoom lenses allows the photographer to select the exact focal length he wants from an infinite number within a particularly useful range. The super-wide-to-normal 24-50mm lens covers the most popular wideangle focal lengths to normal 50mm. The uniquely designed 35—70mm lens zooms over a very useful wide-normal-tele range and features convenient close focusing. The lightweight, normal-to-tele Minolta 50—135mm lens is the perfect lens for candids, portraits, etc.

The 75—200mm model thus provides in only one lens the collective telescopic advantages of short and medium fixed telephotos and more. The extraordinary 100—500mm is light and compact despite its great focal-length range, which is especially effective in sports and nature photography. Each of these lenses is a light compact new design equipped for full-aperture metering/focusing and automatic diaphragm operation. And each can be zoomed and focused with one hand on a positive, comfortable grip of waffle-textured rubber — another instance of the easy handling Minolta is famous for.

The catadioptric-type Minolta 250mm, 500mm, 800mm and 1600mm RF lenses utilize precision ground-and-polished mirrors in combination with conventional refractive lens elements in their designs. Light travels the length of the barrel three times in an overlapping reflex path, resulting in relatively small bluk for such enormous focal lengths.

This compactness is particularly striking in the Minolta 500mm RF lens, which yields some 10 times the magnification of a standard lens yet can even be used hand-held—rare with optics of this great focal length.

All of these mirror lenses are suited for sports, landscape, and nature photography at extreme distances. Lens-stop settings for them are achieved with neutral-dessity filters, which, like the special "sharp-cut" filters provided, constitute integral elements of the optical system.

Minolta 85mm f/2.8 Varisoft

Construction: 6 elements in 5 groups
Angle of view: 29°
Min. focus distance: 0.8m (2.6 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/2.8–f/16

This, the perfect portrait and general use lens, is the world's first 35mm single lens reflex lens to offer continuous soft-focus adjustment control. Merely turning the softness control ring from notch "0" (sharp focus) to "1", "2", or "3" (soft focus) increases the degree of optical softness.

At the "0" setting, the lens functions as a conventional 85mm lens. Turning the softness control ring alters the spherical aberration of the lens to create soft-focus effects.

The lens has many distinctive features. The consecutive softness level and aperture can be separately altered at will, an important feature for photographers working indoors with strobe. Also, in soft-focus rendition with the Minolta Varisoft lens, every image point has sharp image core and soft halo component surrounding the core on the film plane. Thus, subject details can be rendered on the film even when covered by the broad halo, ensuring a beautiful soft-focus photograph each time the lens is used.

Minolta 85mm f/2 MD

Construction: 6 elements in 5 groups
Angle of view: 29°
Min. focus distance: 0.85m (2.8 ft.)
Filter thread diameter: 49mm
Diaphragm: Auto preset f/2—f/22

Minolta 100mm f/2.5 MD

Construction: 5 elements in 5 groups
Angle of view: 24°
Min. focus distance: 1m (3.3 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/2.5—f/22

Minolta 135mm f/3.5 MD

Construction: 5 elements in 5 groups
Angle of view: 18°
Min. focus distance: 1.5m (4.9 ft.)
Filter thread diameter: 49mm
Diaphragm: Auto preset f/3.5—f/22

Minolta 135mm f/2.8 MD

Construction: 5 elements in 5 groups
Angle of view: 18°
Min. focus distance: 1.5m (4.9 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/2.8—f/22

Minolta 200mm f/4 MD

Construction: 5 elements in 5 groups
Angle of view: 12°30′
Min. focus distance: 2.5m (8.2 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/4—f/32

Minolta 200mm f/2.8 MD

Construction: 5 elements in 5 groups
Angle of view: 12°30′
Min. focus distance: 1.8m (6 ft.)
Filter thread diameter: 72mm
Diaphragm: Auto preset f/2.8—f/32

Minolta 300mm f/5.6 MD

Construction: 5 elements in 5 groups
Angle of view: 8°10′
Min. focus distance: 4.5m (14.8 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/5.6—f/32

Minolta 300mm f/4.5 MD

Construction: 7 elements in 6 groups
Angle fo view: 8° 10′
Min. focus distance: 3m (9.8 ft.)
Filter thread diameter: 72mm
Diaphragm: Auto preset f/4.5—f/32

Minolta 400mm f/5.6 MD APO

Construction: 7 elements in 6 groups
Angle of view: 6° 10′
Min. focus distance: 5m (16.4 ft.)
Filter thread diameter: 72mm
Diaphragm: Auto preset f/5.6—f/32

Minolta 600mm f/6.3 MD APO

Construction: 9 elements in 8 groups
Angle of view: 4° 10′
Min. focus distance: 5m (16.4 ft.)
Filter thread diameter: Built-in
Diaphragm: Auto preset f/6.3—f/32

Minolta 250mm f/5.6 RF

Construction: 2 mirrors, 6 lens elements in 5 groups
Angle of view: 10°
Min. focus distance: 2.5m (8.2 ft.)
Filters: Built-in
F-stops: f/5.6, f/11 and f/16 by ND filters

32 **Minolta 500mm f/8 RF**

Construction: 2 mirrors, 6 lens elements in 5 groups
Angle of view: 5°
Min. focus distance: 4m (13.1 ft.)
Filters: Built-in
F-stops: f/8 and f/16 by ND filter

Minolta 800mm f/8 RF

Construction: 2 mirrors,
8 lens elements in 7 groups
Angle of view: 3°10′
Min. focus distance: 8m (26.2 ft.)
Filters: Built in
F-stops: f/8 and f/16 by ND filter

Minolta 1600mm f/11 RF

Construction: 2 mirrors,
6 lens elements in 5 groups
Angle of view: 1°30′
Min. focus distance: 20m (65.6 ft.)
Filters: Built-in
F-stops: f/11 and f/22 by ND filter

Minolta 24–50mm f/4 MD Zoom

Construction: 13 elements in 11 groups
Angle of view: 84°–47°
Min. focus distance: 0.7m (2.3 ft.)
Filter thread diameter: 72mm
Diaphragm: Auto preset f/4–f/22

Minolta 35–70mm f/3.5 MD Zoom

Construction: 8 elements in 7 groups
Angle of view: 63°–34°
Min. focus distance: 1m (3.3 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/3.5–f/22

Minolta 50—135mm f/3.5 MD Zoom

Construction: 12 elements in 10 groups
Angle of view: 47°—18°
Min. focus distance: 1.5m (4.9 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/3.5—f/22

Minolta 75—200mm f/4.5 MD Zoom

Construction: 15 elements in 11 groups
Angle of view: 32°—12° 30′
Min. focus distance: 1.2m (3.9 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/4.5—f/22

Minolta 100–200mm f/5.6 MD Zoom

Construction: 8 elements in 5 groups
Angle of view: 24° – 12°30′
Min. focus distance: 2.5m (8.2 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/5.6–f/22

Minolta 100–500mm f/8 MD Zoom

Construction: 16 elements in 10 groups
Angle of view: 24° – 5°
Min. focus distance: 2.5m (8.2 ft.)
Filter thread diameter: 72mm
Diaphragm: Auto preset f/8–f/32

Close-ups and Photomacrography: Striking New Views of Ordinary Objects

Of all the kinds of photography possible with the Minolta SLR system, the two that probably yield that most consistently unusual pictures are close-up photography and photomacrography.

For even the beginning photographer the possibilities in these fields are practically unlimited, and the results are almost always uncommonly exciting. Everyday objects such as stamps or coins, mechanical subjects such as the movements or gears of a wrist watch, insects, plants and myriads more take on aspects missed by the human eye. The commonplace becomes extraordinary through magnification.

The world of close-ups and photomacrography—i.e., close pictures at up to a dozen or so times life size—provides a stimulating challenge for any photographer to test his techniques and imagination. But today, particularly using a TTL-metering Minolta SLR with special attachments makes these kinds of photography easier, faster, and more practical than ever before.

The main advantage of using these cameras with accessories for close-ups or photomacrography is that the through-the-lens metering system eliminates the need to calculate exposure factor or effective aperture. It thus does away with the most complicated and troublesome factor involved with longer-than-normal extension: Since light is measured through the lens and any other Minolta close-up or extension devices being used, all adjustment for exposure is completely automatic, regardless of magnification ratio.

38

Minolta 50mm f/3.5 MD Macro

Construction: 6 elements in 4 groups
Angle of view: 47°
Min. focus distance: 0.23m (9 in.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f/3.5—f/22
Accessory: Life-Size Adapter

Minolta 100mm f/4 MD Macro

Construction: 5 elements in 4 groups
Angle of view: 24°
Min. focus distance: 0.45m (1.5 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset f4—f/32
Accessory: Life-Size Adapter

Used with a Minolta SLR, the Minolta 50mm and 100mm Macro lenses make photomacrography easier than ever before. All information required to determine magnification ratio and adjust exposure with non-TTL cameras is engraved on the lens barrel. With our TTL SR-T series cameras, the lens is set for correct exposure simply by turning its aperture ring until the two needles are aligned in the viewfinder. With our new electronic-shutter models, exposure control can be completely automatic. Either of these lenses attaches to any Minolta SLR camera and focuses all the way from infinity to half life-size in its regular mount without attachments. Using the life-size adapter, magnification ratios from half life-size to 1 : 1 (life size) can be obtained. Each of these lenses may also be used for ordinary photography with excellent results.

40 **Minolta 100mm f/4 Auto Bellows**

Construction: 3 elements in 3 groups
Angle of view: 24°
Filter thread diameter: 55mm
Diaphragm: Auto preset f/4—f/32

This lens is designed with a short mount and no focusing ring for use with the Auto Bellows I (see page 48). The focusing range with this bellows is all the way from infinity to 1 : 1 magnification (life size) on the film. This lens' relatively great focal length enables greater lens-to-subject distance, with resulting greater freedom in placement of lighting equipment. Its automatic diaphragm operation facilitates focusing and viewing up to and after the moment of exposure.

LENS	ELEMENTS	GROUPS	METER-COUPLED AUTO-DIAPHRAGM	ANGLE OF VIEW	MINIMUM FOCUS	MINIMUM F-STOP	FILTER-MOUNT DIAMETER	DIMENSIONS	WEIGHT
7.5mm f/4 MD FISHEYE	12	8	Yes	180°	0.5m/1.6 ft.	f/22	built-in	φ68 x 63mm	345g/12-3/16 oz.
16mm f/2.8 MD FISHEYE	11	8	yes	180°	0.3m/1 ft	f/22	built-in	φ70.5 x 63.5mm	440g/15-1/2 oz
17mm f/4 MD	11	9	yes	104°	0.25m/0.8 ft.	f/22	72mm	φ75 x 53mm	325g/11-3/8 oz.
20mm f/2.8 MD	10	9	yes	94°	0.25m/0.8 ft.	f/22	55mm	φ64.5 x 43.5mm	235g/8-5/16 oz.
24mm f/2.8 MD	9	7	yes	84°	0.3m/1 ft	f/22	55mm	φ65 x 50mm	275g/9-5/8 oz.
24mm f/2.8 MD VFC	9	7	yes	84°	0.3m/1 ft.	f/22	55mm	φ67 x 50.5mm	340g/12 oz.
28mm f/3.5 MD	5	5	yes	75°	0.3m/1 ft.	f/22	49mm	φ64 x 40.5mm	160g/5-5/8 oz.
28mm f/2.8 MD	7	7	yes	75°	0.3m/1 ft.	f/22	49mm	φ64 x 43.5mm	180g/6-3/8 oz.
28mm f/2 MD	10	9	yes	75°	0.3m/1 ft.	f/22	55mm	φ65.5 x 61mm	345g/12-3/16 oz.
35mm f/2.8 MD	5	5	yes	63°	0.3m/1 ft	f/22	49mm	φ64 x 38.5mm	165g/5-13/16 oz.
35mm f/1.8 MD	8	6	yes	63°	0.3m/1 ft.	f/22	49mm	φ64 x 48mm	235g/8-5/16 oz.
35mm f/2.8 SHIFT CA	9	7	No; auto diaph'm	63°	0.3m/1 ft	f/22	55mm	φ83.5 x 71.5mm	560g/1 lb. 3-3/4 oz.
45mm f/2 MD	6	5	yes	51°	0.6m/2 ft	f/16	49mm	φ64 x 30.5mm	125g/4-7/16 oz.
50mm f/1.7 MD	6	5	yes	47°	0.45m/1.5 ft	f/16	49mm	φ64 x 36mm	160g/5-5/8 oz.
50mm f/1.4 MD	7	6	yes	47°	0.45m/1.5 ft	f/16	49mm	φ64 x 40mm	220g/7-3/4 oz.
50mm f/1.2 MD	7	6	yes	47°	0.45m/1.5 ft	f/16	55mm	φ65.5 x 46.5mm	315g/11-1/8 oz.
85mm f/2.8 VARISOFT	6	5	yes	29°	0.8m/2.6 ft.	f/16	55mm	φ70 x 80mm	430g/15-3/16 oz.
85mm f/2 MD	6	5	yes	29°	0.85m/2.8 ft.	f/22	49mm	φ64 x 53.5mm	280g/9-7/8 oz.
100mm f/2.5 MD	5	5	yes	24°	1m/3.3 ft.	f/22	55mm	φ64.5 x 64.5mm	365g/12-7/8 oz.
135mm f/3.5 MD	5	5	yes	18°	1.5m/5 ft.	f/22	49mm	φ64 x 72.5mm	260g/9-5/16 oz.
135mm f/2.8 MD	4	4	yes	18°	1.5m/5 ft.	f/22	55mm	φ64 x 82mm	365g/12-7/8 oz.

LENS	ELEMENTS	GROUPS	METER-COUPLED AUTO-DIAPHRAGM	ANGLE OF VIEW	MINIMUM FOCUS	MINIMUM F-STOP	FILTER-MOUNT DIAMETER	DIMENSIONS	WEIGHT
200mm f/4 MD	5	5	yes	12°30′	2.5m/8.2 ft.	f/32	55mm	φ64.5 x 131mm	515g/1 lb. 2-3/16 oz.
200mm f/2.8 MD	5	5	yes	12°30′	1.8m/5.9 ft.	f/32	72mm	φ78 x 133mm	700g/1 lb/8-11/16 oz.
300mm f/5.6 MD	5	5	yes	8°10′	4.5m/15 ft.	f/22	55mm	φ65 x 186mm	695g/1 lb. 8-1/2 oz.
300mm f/4.5 MD	7	6	yes	8°10′	4.5m/15 ft.	f/22	72mm	φ80 x 199.5mm	710g/1 lb. 9 oz.
400mm f/5.6 MD APO	7	6	yes	6°10′	5m/16 ft.	f/32	72mm	φ83 x 256.5mm	1440g/3 lb. 2-13/16 oz.
600mm f/6.3 MD APO	9	8	yes	4°10′	5m/16 ft.	f/32	95mm	φ108.5 x 373.5mm	2400g/5 lb. 4-5/8 oz.
250mm f/5.6 RF	6 2 Mirrors	5	No	10°	2.5m/8 ft.	f/16	Built-in	φ66.5 x 58mm	250g/8-13/16 oz.
500mm f/8 RF	6 2 Mirrors	5	No	5°	4m/13 ft.	f/16	Built-in	φ83 x 98.5mm	600g/1 lb. 5-3/16 oz.
800mm f/8 RF	8 2 Mirrors	7	No	3°10′	8m/26 ft.	f/16	Built-in	φ125 x 166.5mm	1900g/4 lb. 3 oz.
1600mm f/11 RF	6 2 Mirrors	5	No	1°30′	20m/70 ft.	f/22	Built-in	φ178 x 322.5mm	6850g/15 lb. 1-5/8 oz.
24-50mm f/4 MD ZOOM	13	11	yes	84°–47°	0.7m/2.3 ft.	f/22	72mm	φ75 x 69.5mm	395g/13-15/16 oz.
35-70mm f/3.5 MD ZOOM	8	7	yes	63°–34°	1m/3.3 ft.	f/22	55mm	φ67.5 x 65.5mm	365g/12-7/8 oz.
50-135mm f/3.5 MD ZOOM	12	10	yes	47°–18°	1.5m/4.9 ft.	f/22	55mm	φ68.5 x 118mm	480g/1 lb. 15/16 oz.
75-200mm f/4.5 MD ZOOM	15	11	yes	32°–12°30′	1.2m/4 ft.	f/22	55mm	φ69.5 x 155mm	630g/1 lb. 6-1/4 oz.
100-200mm f/5.6 MD ZOOM	8	5	yes	24°–12°30′	2.5m/8 ft.	f/22	55mm	φ63.5 x 173mm	570g/1 lb. 4-1/8 oz.
100-500mm f/8 MD ZOOM	16	10	yes	24°–5°	2.5m/8 ft.	f/32	72mm	φ91 x 330mm	2030g/4 lb. 7-5/8 oz.
50mm f/3.5 MD MACRO	6	4	yes	47°	0.23m/9 in.	f/22	55mm	φ64.5 x 55.5mm	205g/7-1/4 oz.
100mm f/4 MD MACRO	5	4	yes	24°	0.45m/1.5 ft.	f/32	55mm	φ66.5 x 88.5mm	380g/13-3/8 oz.
100mm f/4 AUTO BELLOWS	3	3	No; auto diaph'm	24°	—	f/32	55mm	φ63.5 x 34.5mm	155g/5-7/16 oz.

The Tools of Close-up Photography and Photomacrography

Even without accessories or attachments, the standard lenses on Minolta SLR cameras permit a considerable variety of close-up photography. All the Minolta MD 50mm lenses can be focused for pictures as close as 45cm (1.5ft.) in their standard mountings on the camera. But to get closer to your subject for even more dramatic results, use Minolta's special equipment designed to provide photographs much larger than life size.

The simple combination of a Minolta SLR camera with 50mm lens and a supplementary screw-on close-up lens is sufficient, at modest cost, to do many close-ups and copying. For more specialized work, you can select from a range of Minolta extension tubes and bellows,

special Minolta lenses, and so on for the performance and flexibility needed.

Besides precision lenses or attachments and a measure of patience, the great majority of close-ups and photomacrography will require a sturdy tripod or other base from which to shoot, as the slightest movement of camera or support will be greatly exaggerated. The Minolta Copy Stand, described on page 44, was designed to provide the maximum stability essential in these kinds of photography.

Lighting techniques for photomacrography and close-ups in many ways resemble those for other types of photography. You may wish to experiment with such basic lighting types as back lighting to show edge details, front lighting for standard effects, side lighting to bring out texture, diffuse shadowless lighting for subjects of sufficient color contrast, or transmitted illumination for translucent or transparent subjects. Keep in mind that the considerable heat generated by most lamps will rapidly affect heat-sensitive objects at close range, while living things may wilt or die if kept under the lamps too long.

Close-up Lenses

These lenses screw into the filter mount of normal Minolta lenses to permit focusing at close-up distances. Lenses 1 and 2 may be used in combination to allow work as close as 23cm (9 in.) from the subject. Lens 0 allows closer focusing with short telephoto lenses. With any of these close-up lenses, aperture is set as it would be for normal photography.

46 Extension Tube Set II

The set of five separate tubes can be used in various combinations for close-up photography with Minolta lenses. Function of the tubes is to increase magnification by lengthening the lens-to-film distance. Selection of the proper extension tube or combination depends on the area to be covered or the image size required. When used with TTL Minolta SLR cameras, no compensation for exposure is necessary since exposure readings may be taken directly through the tube and lens combination.

MC Auto Extension Tubes

The purpose of this set of three tubes is the same as for the Extension Tube Set II, but it offers refinements that provide greater ease of use. Full meter-and automatic-diaphragm coupling enables full-aperture metering/focusing, with the diaphragm closing down to the preset aperture only at the moment of exposure with Minolta SLR's and MD or MC Minolta lenses.
Each of the three tubes has a Minolta SLR bayonet on one end and a matching receptacle on the other; this all-bayonet system makes for fast, easy attaching and changing.

Reverse Ring II

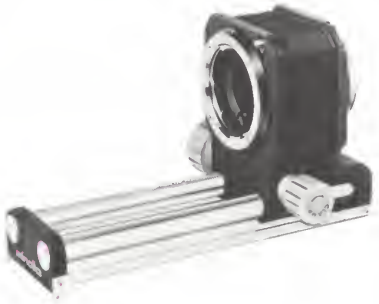
The Minolta Reverse Ring II enables using various Minolta lenses, particularly wideangle and normal, turned front to rear for considerably improved image quality at magnifications greater than life size (1:1 image-to-subject reproduction ratio).

Bellows III

Modest in price, compact, and lightweight, this quality bellows attaches to the camera in the same way as a lens and provides calibrated extension between lens and film by means of a scale engraved on the track. Magnifications between 0.75X and 2.96X can be obtained with this unit and a 50mm lens. Among the optional accessories common to this unit and the Auto Bellows 1 described on the next page is a slide copier attachment for duplicating transparencies.

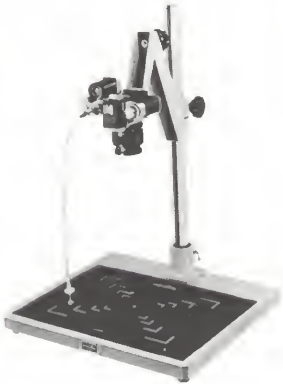
Auto Bellows I

This deluxe, double-track bellows performs all of the functions of the Bellows III on page 43 and further features an automatic-diaphragm coupling device. With MD or MC lenses, this coupler allows focusing and viewing at full-aperture brightness, with the lens closing down to the preset aperture only at the moment of exposure. Used with a standard 50mm lens, the Auto Bellows I permits a continuous range of magnifications from 0.7X to 3X. The detachable focusing rail can also be used separately for focusing or positioning a camera equipped with lens only, extension tubes, or a close-up lens.



Copy Stand II

A rigid camera support that assures maximum stability in all photomacrography, this unit is highly recommended when photographing either flat or three-dimensional objects. Unusually sturdy, the stand features a heavy-duty 39.4 x 45cm (15-1/2 x 17-3/4 in.) baseboard and a 61cm (24 in.)-high chrome tube 5cm (2 in.) in diameter to provide secure support for camera and macro equipment.



Magnifier Vn

This is a useful tool for precise focusing when making photomacrographs, copying, and taking distant telephoto pictures. It features an adjustable eyepiece and 2.5X magnifying power. It slides on over the camera eyepiece and can be focused for individual eyesight.

Angle Finder V

This device permits viewing with the camera held below the eye. It can be focused for individual eyesight, and is ideal for microscopic photography and many other applications. It slides on over the camera eyepiece.

Photography Through the Microscope

Going from several diameters' magnification with photomacrography to tens or hundreds of diameters, we descend into an even stranger and more fascinating microcosm. Using your Minolta SLR in combination with one of the following units, you can capture on film the beauties and mysteries of this normally invisible world of photomicrography. Included in this group of products for use with these SLR's is the relatively simple and inexpensive Minolta Microscope Adapter; the precise and versatile Leitz-system Micro attachment. One of these should meet your photomicrography needs, whether simple or complex, in the most demanding scientific work or in shooting for sheer illustrative or abstract effects.

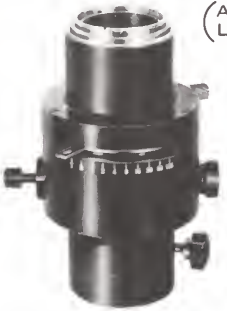
Microscope Adapter

This two-piece device is used to connect an SLR camera to a microscope. One section bayonets into the camera body in place of the lens, while the other end fits into the ocular adapter tube section of the microscope. Taking photomicrographs is convenient with this adapter because you can follow moving specimens up to the precise moment of exposure. The adapter fits ocular tubes from 23mm to 29mm in diameter.

Leitz "Micro-attachment"

The Minolta SLR bayonet-mount connecting adapter on this attachment makes Minolta single-lens reflexes a part of the Leitz "Universal Camera System for Photomicrography." A highly sensitive built-in phototube sensor enables rapidly making very delicate exposure measurements even of small object details. A vibration absorber is built into the top of the Micro-attachment to prevent any image unsharpness due to transmitted vibration. The field of view as it will appear on the film is clearly visible in the camera viewfinder, making it easy to follow moving specimens up to and after the moment of exposure.

(Available only through Leitz Dealers)



Minolta Flash Units

No matter which of the major types of photoflash you prefer, it is available from Minolta. There is a unit for your Minolta SLR, whether you use conventional flashbulbs for occasional shooting with maximum light output or choose regular electronic flash (sometimes also called "strobe") for greater action-stopping power, convenience, and economy. Further, with an automatic electronic flash, which figures its own exposure exactly, you'll never have to think of guide-number calculations again. With auto-flash, a sensor receives light reflected from the subject and turns the flash off the microsecond that proper exposure is reached. Auto Electroflash 450 and 280 represent the vanguard of the industry in offering the very latest thyristor series circuitry for maximum flashes per battery and shortest recycling time.

Auto Electroflash 200X

This new generation, compact flash unit is designed for use on the XD or XG series cameras and can also be used cordlessly on many other cameras.
It makes perfectly exposed autoflash exposures at either of two apertures or can be operated manually. When attached to an XD or XG and ready to fire, the 200X starts a flash ready LED blinking in the viewfinder and automatically sets the camera's shutter speed (1/100 sec.) when the shutter is released. Guide number is up to 20 for meters at ASA 100, 33 for feet at ASA 25.

Auto Electroflash 25

This compact cordless/corded unit with a guide number of 25 (m, ASA 100; 41 for ft., ASA 25) slides into the hot shoe on Minolta SLR cameras and makes completely automatic electronic flash exposures by means of a built-in sensor or can be used as a conventional non-auto unit. Recycling is indicated by a monitor lamp.

Auto Electroflash 132X and 128

Compact cordless/corded units with guide number of 32 and 28 (in meters for ASA 100, 52 and 46 in feet at ASA 25). Both units feature a tiltable flash head for bounce flash and special flash distance check lamp that lights when brightness is sufficient for correct autoflash exposure.

Auto Electroflash 132X has an illuminated control dial with LED autoflash aperture setting indication and can select two different apertures. When this model is attached to an XD or XG camera and ready to fire, it starts a flash-ready signal in the viewfinder blinking and automatically sets the camera for X-sync. when the shutter is released. Optional Ni-Cd battery charger, wide panel for 24mm lens coverage, and color filter set are available.

Auto Electroflash 280

Automatic direct/bounce flash exposure is a feature of this cordless/corded clip-on unit. The 280 yields a maximum guide number of 28 (in meters at ASA 100, 46 in feet at ASA 25). To maximise on energy-saving, a series-thyristor circuit is incorporated to give the shortest recycling time and the maximum number of flashes per battery.

The 280 covers the field of a 35mm lens, and lets you select from four apertures on any setting to get just the shot you want under any conditions. Power sources are alkalimanganese or rechargeable Ni-Cd batteries. Optional Ni-Cd charger is also available.

Auto Electroflash 450

A versatile system electronic-flash unit, Auto Electroflash 450 yields the maximum guide number of 45 (for calculations in meters at ASA 100, 72 in feet at ASA 25). The 450 does everything the 280 does—and more. The field of a 24mm lens is easily covered with the wideangle diffuser. Automatic bounce/off-camera flash exposure is possible with the attachment of the optional separate sensor. With five apertures to choose from on any setting, perfect exposure is assured. The monitor-lamp circuit provides accurate guide numbers for nonautomatic operation. The 450 is powered by alkali-manganese batteries, or optional rechargeable Ni-Cd battery cartridges. An optional charger is available for recharging of cartridge.

Minolta Light Meters

Besides world-renowned cameras, lenses, and other products, Minolta makes and markets a full line of meters for every major photo-exposure purpose. And at Minolta we produce our own silicon photo cells for these and the meters built into our cameras.

At the request of NASA, the U.S.A.'s National Aeronautics and Space 'Administration, Minolta developed and produced the Space Meter, which was used for critical exposure measurement on epoch-making Apollo missions to the moon. This feat gives some indication of the distinguished state of the photometric art at Minolta.

You put this same superior technology to work for you whichever of the remarkable Minolta light meters you may choose.

Auto-Spot II and Auto-Spot II Digital

These single-lens reflex exposure meters with 1° angle of acceptance have silicon-photo cells, and operate as rapid as you sight your subject. Illuminated scale in Auto-Spot II and digital display on Auto-Spot II digital enhance easy and accurate readings under dim conditions. ASA range: 3 to 25,000 (12 to 6,400 with "digital") EV range: 3 to 17 (1 to 20) Aperture range: 1 to 45 (1 to 90) Shutter-speed range: 1/2000 to 30 sec. (1/2000 to 15 sec.) Cine range: 8 to 128 fps (with sector opening 180°)

Auto Meter II

This sophisticated meter features effortless one-hand operation with a battery-powered, moving scale that gives instant direct reading completely automatically—no needle reading or manual dial alignment is necessary. A sensitivity silicon photo cell and high-grade integrated circuit give both incident and reflected-light readings with high accuracy over an unusually wide range. The light sturdy unit features automatic over- and under-exposure warning indications. Accessories available are: Viewfinder 10° for reflected-light measuring, ND diffuers, spot mask and mini receptor.

Flash Meter II

Remarkably accurate thanks to ideal combination of a high-response silicon photo cell with high-stability electronic components, this meter gives incident or reflected readings of bulb or electronic flash as well as continuous illumination. The practical feature of this unit also enables reading the total brightness of multi or sequent flashes. In either way, readings are resistered directly in f-numbers; no calculations or conversions are needed. The Minolta Flash Meter II offers a selection of measuring times (shutter speeds) for convenient measurement of fill-in flash in combination with ambient light. Compact and lightweight, this unit incorporates specially designed LSI (large scale integrated circuit) for computation and A/D (analogue/digital) convertion.

F-numbers are digitally indicated by LED for easy and accurate reading under dim conditions. Optional accessories available for increased versatility include a viewfinder 10°, mini receptor, spherical ND diffuser, flat diffuser and multi-purpose sync. cord.

Minolta Solid Glass Filters

Minolta's filters are invaluable for correcting or obtaining various photographic effects. They are made of solid glass ground optically flat in Minolta's own factories to prevent distortion and mounted in satinfinish metal rings.

Refer to the following brief explanations to determine which filters best suit your photographic purposes, or consult your Minolta dealer for further information. The table on page 60 indicates the mount diameters in which the various Minolta filters are available.

For Black-and-White Photography

UV: This filter absorbs excessive ultraviolet rays when shooting mountain, snow, and other distant scenes. Exposure is the same as without a filter, and it may be kept attached to protect the lens.

Green: For correct monochromatic rendition of colored subjects as they appear to the eye, this filter is used with panchromatic film.

Yellow: Red and yellow subjects are rendered lighter than the eye sees them by this filter. It tends to increase overall contrast somewhat and is often used to darken blue skies and emphasize white clouds

Orange: Use of this filter with panchromatic films produces effects similar to but more pronounced than those with a yellow filter.

Red: This filter used with panchromatic materials greatly lightens red, produces strong contrast, and can be used for exaggerated cloud effects: Used in combination with infrared film, it eliminates atmospheric haze and produces spectacular, high-contrast effects.

For Color Photography

1A: Use this filter to improve bluish rendition of subjects in shade illuminated by blue sky, on overcast or rainy days, or obscured by atmospheric haze. It requires no increase in exposure and is often used with color or monochromatic materials to protect the lens.

80B: This filter is used for shooting with daylight-type color film indoors with artificial light of 3400° K color temperature (as of photoflood lamps).

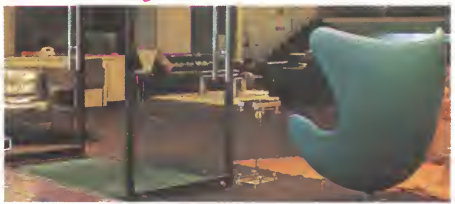
85: Type A color films (balanced for exposure with light of 3400° K color temperature) can be used in daylight by exposing through this filter.

For Black-and-White and Color Photography

Polarizing Filter: This filter is ideal for reducing or eliminating specular reflections as from glass or water to provide clearer views or richer tones or textures; it can also be used to darken skies in either color or monochrome.

ND X4: Used to adjust light volume from a scene or subject, this neutral density filter can be employed to avoid over-exposure (as when shooting beach or brilliant snow scenes, especially with fast films). It is also useful for depth-of-field control under certain condition to emphasize a subject against an out-of-focus background.

With Polarizing Filter



No Filter

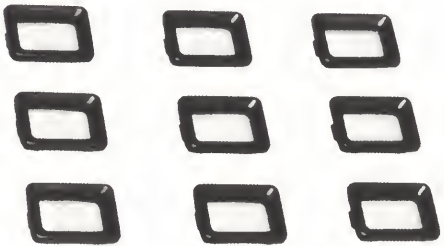
Filter Sizes

L37 (UV)		49mm*	55mm*		72mm*
L39 (UV)	46mm			67mm	
Y52 (Yellow)	46mm	49mm*	55mm*		72mm*
R60 (Red)		49mm*	55mm*		72mm*
O56 (Orange)		49mm*	55mm*		72mm*
GO (Green)		49mm*	55mm*		
Polarizing		49mm	55mm		
B12 (80B)	46mm	49mm*	55mm*		72mm*
A12 (85)		49mm*	55mm*		72mm*
1A				67mm	72mm*
1B		49mm*	55mm*		
NDx4	46mm	49mm*	55mm*		72mm*

* Achromatic coated

Eyepiece Corrector V_N

Focusing aid for far- and near-sighted photographers are provided by these special lenses which snap into grooves provided in the camera eyepiece. Minolta makes nine different diopter strengths, from −4 to +3.



Panorama Head II

The Minolta Panorama Head II is specially designed to be attached between a Minolta single-lens-reflex camera and a tripod for photographing panoramic views up to a full 360° in a sequence of photos that can be matched accurately.

It can be set to automatically provide proper interval and overlap between successive frames with various Minolta lenses and has a built-in level. Excellent panoramas can thus be easily made without the need of checking coverage of each frame through the viewfinder.

64 Lens Mount Adapter

Minolta makes Practica lens adapter, which locks securely on Minolta SLR camera bodies with the use of the special key provided. Any Praktica-mount lenses can be used with Minolta SR-T cameras and can be focused throughout its full range.

Cable Release II

The very flexible metal release threads directly into the shutter release button on Minolta SLR's and is essential for steady tripod exposures, photomicrography, photomacrography, and telephotography. It features a convenient coaxial type lock, which facilitates making time exposures.

This booklet has briefly described many of the Minolta and Minolta/Celtic lenses and the accessories of Minolta's extensive SLR system. You can use them either with a standard Minolta SLR or on one of our new electronic shutter models offering interchangeable finders and fully automatic exposure control. Either way, you'll enjoy genuine Minolta quality, precision, and the handling and operating ease we are famous for.

Be sure to talk with your Minolta dealer; he can help you learn more about all the fine Minolta products and what they can do for you. Or contact the Minolta distributor or branch office in your area.

Specifications subject to change without notice

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